NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

RESIDUE MANAGEMENT, RIDGE TILL

(Acre)

CODE 329C

DEFINITION

Managing the amount, orientation, and distribution of crop and other plant residues on the soil surface year-round, while growing crops on preformed ridges alternated with furrows protected by crop residue.

PURPOSES

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- Reduce sheet and rill erosion.
- Reduce wind erosion.
- Maintain or enhance soil organic matter content and tilth.
- Manage snow to increase plant available moisture.
- Modify cool wet site conditions.
- Provide food and escape cover for wildlife

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland.

This standard includes tillage and planting methods commonly referred to as ridge till or ridge planting. It does not include no till planting on ridges, or bedding or listing operations which bury crop residues.

CRITERIA

General Criteria Applicable to All Purposes Named Above

Following crop harvest and any secondary residue removal, residues shall be maintained until planting with no additional disturbance except for normal weathering.

Ridge height shall be maintained throughout the harvest and winter seasons by controlling equipment or livestock traffic.

After planting, residues shall be maintained in the furrows until the ridges are rebuilt by cultivation. Ridges shall be rebuilt to their original height and shape during the last row cultivation.

Loose residues to be retained on the field shall be uniformly distributed on the soil surface. Where combines or similar machines are used for harvesting, they shall be equipped with spreaders capable of distributing residue over at least 80 percent of the working width of the header.

Cultivation and planting equipment designed to operate on ridges shall be used, such as cultivators equipped with ridging attachments, and planters equipped with ridge planting attachments such as row cleaning devices and guidance systems.

Crop residues will not be burned.

Additional Criteria to Reduce Sheet and Rill Erosion

The amount and placement of residue needed, and the orientation of ridges in relation to the contour, shall be determined using current approved erosion prediction technology. Calculations shall account for the effects of other practices in the conservation management system. Partial removal of residue by means such as baling or grazing, shall be limited to retain the amount needed to meet soil erosion reduction objectives.

Planting and fertilizer placement shall disturb no more than one third of the row width. Soil and residue removed from the top of the ridge shall be moved into the furrow between the ridges.

After planting, the top of the ridge shall be maintained at least 3 inches higher than the furrow between the ridges.

The ridge shall be shaped to prevent erosion along the row by directing runoff to the protected furrow area.

Additional Criteria to Reduce Wind Erosion

The amount and orientation of residue needed during periods when wind erosion is expected to occur, shall be determined using current approved wind erosion prediction technology. Partial removal of residue by means such as baling or grazing, shall be limited to retain the amount needed to control erosion. Calculations shall account for the effects of ridge height, spacing, and direction, and of other practices in the conservation management system.

Additional Criteria to Maintain or Enhance Soil Organic Matter Content and Tilth

The amount of residue needed to achieve the desired soil condition shall be determined on a field by field basis. The crop rotation will consist of at least 50 percent non-fragile, high-residue producing crops. Partial removal of crop residue by means such as baling or grazing shall be limited to those crops designated as non-fragile residue as listed in the Kansas Field Office Technical Guide, Section I – General Resources References, Part 1 – Water Erosion, Table C-5, Residue Types (page 12). No more than 50 percent of total residue remaining after harvest of the crop will be removed.

Organic matter content or trends will be determined using currently approved technology.

Cultivation to rebuild ridges shall be done using tools which maintain residues in the surface layer.

Additional Criteria to Manage Snow to Increase Plant Available Moisture

Stubble shall be left standing as high as possible by the harvesting operation, but not less than 6 inches in any case. Stubble shall be maintained standing over winter to trap and retain snow. In cases where the 6-inch stubble height cannot be achieved, ridges shall be oriented not to exceed 45 degrees from perpendicular to the prevailing wind direction during periods of expected snow cover.

Additional Criteria to Modify Cool, Wet Site Conditions

Ridge height prior to planting shall not be less than 6 inches. After planting, the top of the ridge shall be maintained at least 3 inches higher than the furrow between the ridges.

Additional Criteria to Provide Food and Escape Cover for Wildlife

The amount of residue and height of stubble needed to provide cover during winter months shall be determined using an approved habitat evaluation procedure. Residues shall not be removed unless it is determined by the habitat evaluation procedure that removal will not adversely affect habitat values. Stubble shall be maintained standing over winter.

Where migratory waterfowl and/or sandhill cranes are the species of concern, residue shall be present during both the spring and fall migration.

CONSIDERATIONS

Burning of plant residue or excess removal of residue by such means as baling or grazing often produces negative impacts on resources. These activities should not be performed without full evaluation of impacts on soil, water, animal, plants, and air resources.

Ridge till may be practiced continuously throughout the cropping sequence, or may be managed as part of a residue management system which includes other tillage and planting methods such as mulch till or no till. In mixed systems, ridges must be periodically re-established.

Production of adequate amounts of crop residues necessary for the proper functioning of this practice can be enhanced by selection of high residue producing crops and crop varieties in the rotation, use of cover crops, and adjustment of plant populations and/or row spacings.

By combining a choice of weed control methods, such as band application over the row area and timely cultivation this practice can reduce herbicide requirements.

Where improvement of soil tilth is a concern, continuous ridge planting will allow organic material to accumulate in the surface horizon.

Reconstruction of ridges in the same row area year after year will maximize organic matter buildup and biological activity in the row.

Soil compaction may be reduced by controlled traffic, where wheel traffic from all operations is limited to the area between designated rows or traffic areas.

Where ridges direct runoff to areas of concentrated flow, these areas can be protected by grassed waterways, water and sediment control basins, underground outlets, or other suitable practices.

The value of residues for wildlife habitat can be enhanced by leaving rows of unharvested crops standing at intervals across the field.

Consider the implementation of this practice with Conservation Practice Standard 386, Field Border, to enhance row alignment, eliminate crossing turn rows, and provide travel lanes for field and harvesting equipment.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

All equipment operations will be conducted to keep tire traffic off the ridges. Small odd areas, point rows or other turning areas may need to be planted using no-till to avoid turning on ridges. Another alternative would be to establish permanent vegetative cover in areas just described.